Health&Safety Manual

Supplement 7.02

LLNL Health Hazard Communication Program

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Approved by the ES&H Working Group

_____ **date** _____

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LLNL Health Hazard Communication Program*

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LLNL Health Hazard Communication Program

1.0 Introduction

1.1. Scope

The Occupational Safety and Health Administration (OSHA) and the Department of Energy (DOE) require all employers to establish programs (commonly known as "right-to-know" programs) that inform employees about potential hazards in the workplace. This supplement complies with that requirement. It describes LLNL Health Hazard Communication Program and how to implement it. The supplement also contains requirements for biological, chemical, ergonomic, noise, and physical hazards. Appendix A contains terms and definitions used in this supplement. The other appendices provide additional guidance and requirements.

1.2 Regulatory Overview

DOE Order 5480.10 (Contractor Industrial Hygiene Program) exceeds the minimum OSHA criteria required for health hazard communication. This order requires contractors to establish comprehensive programs that

- inform workers of the presence of workplace health hazards, the potential harmful effects of these hazards, and the appropriate control measures;
- provide written notification to employees on the results of environmental monitoring, particularly when employees have been exposed above permissible limits;
- explain the content of applicable hazard communication standards and orders.

The following OSHA health regulations have training requirements applicable to LLNL health hazard activities:

- 29 CFR 1910.1200 and 1910.1450—Chemicals
- 29 CFR 1910.1030—Biological hazards (This regulation covers autoimmune deficiency syndrome (AIDS) and the hepatitis B virus. Proposed rules are being prepared for tuberculosis.)
- 29 CFR 1910.95 —Noise (DOE has a proposed order.)

Proposed OSHA rules for ergonomics are expected in late 1994.

1.3 Applicability

The LLNL Health Hazard Communication Program applies to all work areas. Although the information and training requirements for some operations are different, the main elements are essentially the same. The program also applies to both LLNL and supplemental labor employees. Therefore, supplemental labor employees shall receive the same training and protection as LLNL employees. For the purpose of this supplement, the term "employee" includes all supplemental labor workers. Visitors and participating guests will receive training appropriate to their duties. LLNL will inform subcontractors of any potentially hazardous condition and special protective measures necessary to prevent injury to personnel or damage to property (see Sections 2.7 and 3.1.2). Outside contractors must ensure their employees receive the information and training required by relevant OSHA standards.

In accordance with 29 CFR 1910.1200, below are the limitations for the following work areas and operations:

Laboratories. For the purpose of chemical hazard communication programs, laboratories are fixed places where small amounts of many chemicals are used on a non-production basis for research, and where safety features and procedures common to laboratories are in place. Code of Federal Regulation, Title 29, Part 1910.1450, and Supplement 21.01 (Chemical Hygiene Plan for Laboratories) govern operations in these laboratories.

For completeness, the hazard communication requirements for laboratories are included in this supplement as well as in Supplement 21.01. The differences between laboratories and other workplaces for retaining material safety data sheets(MSDSs) and for container labeling are described in Sections 2.1.2 and 2.2.2, respectively. The training requirements for both are the same.

Warehouses, Storage, and Transportation Operations. In operations where chemicals are handled in sealed containers that are not opened under normal-use conditions, employees shall be provided with the required information and training so that they can protect themselves in the event of a spill or leak of a hazardous chemical. Additional training is required for employees involved in offsite shipping activities. For further details on transporting hazardous chemicals, contact Transportation at ext. 2-7489.

Hazardous Chemicals in Non-Routine, Isolated Instances. The LLNL Health Hazard Communication Program is not applicable to workers (e.g., office workers) who encounter hazardous chemicals only in non-routine, isolated instances. These workers should be provided with basic requirements for the safe use and disposal of hazardous materials.

The following items are exempt from OSHA regulations that govern chemical health hazard communication:

- Any consumer product or hazardous substance used in the workplace in the same manner, duration, and frequency as normal consumer use. For example, cans of spray paint intended for short, one-application use would not be covered by this program. However, routine use of such materials by a professional painter would be covered. Users must understand the hazards of all consumer products and use them in accordance with the precautions on the label or other similar warnings.
- Any hazardous waste that is subject to regulations established by the Environmental Protection Agency.
- Tobacco or tobacco products.
- Wood or wood products when the only hazard is flammability or combustibility. Wood or wood products that have been treated with a hazardous chemical—including wood that may be subsequently sawed or cut, generating dust—are not exempted.
- Articles (manufactured items that do not release hazardous chemicals under normal-use conditions).
- Food, drugs, or cosmetics intended for personal use by employees while in the workplace.
- Any drug in final form that is directly administered to patients. Note that when a pharmaceutical is used in a manner not otherwise exempt, this standard applies.

2.0 Policies and Procedures

2.1 Chemical Hazards

2.1.1 Hazard Identification

In order to inform workers about hazards in the workplace, you must first determine if there is a hazard. Notification can be accomplished by

- determining which types of materials have properties that may cause adverse health or physical effects;
- affixing a label or other forms of warnings to containers, equipment, and other sources of hazardous agents;
- preparing a list of the types of hazards in each work area;
- making the MSDSs available to anyone working in the area.

Once identified, employees must be trained on the nature of the hazards and the protective measures necessary. Following are more specific details on each of the activities previously described:

Hazard Determination. Manufacturers and importers ("producers") of hazardous materials are primarily responsible for evaluating the hazards of such chemicals. These "producers" are required to label containers and prepare the MSDS for each hazardous product. Before using any new material, users should read the label and the MSDS for hazard warnings and precautionary information.

New chemicals synthesized at LLNL and sent offsite must comply with the same hazard identification requirements. For assistance and further details on these requirements, contact the industrial hygienist or your area ES&H team.

Container Labeling. Following are the requirements for labeling hazardous materials:

- The manufacturer's original label must provide the identity of the hazardous chemical(s); the appropriate hazard warnings; and the name and address of the chemical manufacturer, importer, or responsible party. This label shall *not* be removed, changed, or defaced in any way unless the container is immediately marked with the required information. If the label is illegible, missing, or appears to be deficient, the supplier should be contacted to obtain the complete information.

- When materials are transferred from the original container(s), the secondary container(s) (e.g., safety cans, bottles, or plastic jars) must be labeled with the identity of the hazardous chemical(s) and include the appropriate hazard warning. This requirement does not apply to laboratories governed by the LLNL Chemical Hygiene Plan. For those laboratories, labels with formulas, symbols, and codes are recommended but not mandatory. Alternatives to individually labeling small containers may be necessary due to a lack of space on the container itself. Signs, placards, or other written means may be used to indicate the hazardous contents of stationary process containers and their appropriate warnings.

- Laboratories that ship hazardous chemicals must ensure that containers leaving the site are labeled with the identity of the hazardous ingredients. They shall also include the appropriate hazard warnings and the name and address of the manufacturer, importer, or other responsible party.

- Mixtures with less than 0.1% of a carcinogen or other hazardous materials diluted below 1% need not be labeled as carcinogens or hazardous materials. This exemption does not apply to some highly toxic materials that could present a health hazard below these concentrations.

- Hazardous waste containers shall clearly identify special hazards (e.g., carcinogens) and include the minimum information required on the hazardous waste label.

- Pipes and piping systems are not considered containers for the purpose of this program; however, labeling them is recommended as a prudent practice.
- Classified materials may be labeled with a code name, but health and safety information is still required.

Chapter 21 of the *Health & Safety Manual* describes the labeling systems used in general industry. These systems are not necessarily recommended for internal use at LLNL, but containers sent by vendors to LLNL may have such labels. Chemical handlers should be familiar with these labeling systems. For further guidance on label formats and unique labeling situations, contact your area ES&H team.

2.1.2 Material Safety Data Sheets

An MSDS provides data on hazardous ingredients, physical properties, fire and explosive hazards, health hazards, reactivity, spills and leaks, special protection, and special precautions. Manufacturers who produce hazardous chemicals or chemical products are required to prepare an MSDS for each product. LLNL accepts the manufacturer's MSDSs in good faith as to the accuracy of the information contained therein. Before allowing employees to use a particular product, supervisors should obtain the MSDS for that product from the vendor. The Hazards Control Department will review MSDSs for completeness and accuracy upon request.

MSDSs in Work Areas. OSHA requires an MSDS to be present at the "workplace" (i.e., LLNL) for every hazardous chemical in use, to be provided to employees upon request, and to be accessible to employees in their "work areas" (e.g., a shop) during the same work shift. For hazardous chemicals used in laboratories, only MSDSs received with incoming shipments must be maintained. A copy of these MSDSs must also be sent to MSDS, L-384, for filing. Departments are encouraged to establish local MSDS files for regularly used materials. A central file of all MSDSs for materials used at LLNL is maintained by the Hazards Control Department.

Obtaining MSDSs. Employees can obtain a specific MSDS by calling the MSDS Hotline (ext. 3-2122) or by using the MSDS Request Form (see Appendix B). Supervisors who receive hazardous materials (e.g., blanket orders, gifts) directly from outside sources should also request an MSDS and forward it to MSDS, L-384. Those who receive MSDSs directly from vendors must also send a copy to MSDS, L-384, including the name of the Laboratory user, the building number, and the room number where the material is located. These MSDSs are made available on-line through the MSDS Hotline.

LLNL-Produced Chemicals. Chemicals produced, synthesized, or formulated at LLNL must have an MSDS prepared before shipping offsite. Note that hazardous materials diluted to less than 1% and carcinogens diluted to less than 0.1% need not be treated as hazardous. For assistance with preparing an MSDS, see Appendix C and contact your ES&H team industrial hygienist. The container labeling requirements in Section 2.1.1 are also applicable to hazardous materials shipped offsite.

Purchase Requisition. The Procurement Department will request the MSDS from the vendor when placing orders. Supervisors shall check the appropriate boxes on the requisition in the "Does order involve"? section. If you are unsure the material is hazardous, contact your area ES&H team for guidance. *Do not* check the "none of these" box unless you are certain of the hazard level. The purchasing process does not slow down if the appropriate boxes are checked, because the Hazards Control Department reviews requisitions for hazardous materials *after* the order is placed. Review by the department or division placing the order is also encouraged. For more detailed information on controlled substances, refer to Chapter 8 of the *Health & Safety Manual.*

2.1.3 Information and Training

Departments are responsible for ensuring that employees who may be potentially exposed to health hazards are educated and trained in hazard recognition, including the precautions necessary for specific agents in use on their jobs. Course HS0001, "New Employee Orientation," introduces career and supplemental labor workers to the LLNL Health Hazard Communication Program. Subsequent training must be provided to ensure that task- and area-specific details are covered. Training can be provided by line and area supervisors through a combination of formal courses (e.g., HS4240 and EP0006) and on-the-job training. A documented briefing or review of the facility safety procedure (FSP) and / or the operational safety procedure (OSP) may help meet this requirement.

Information. Employees shall be informed of the

- overall purpose and requirements of the LLNL Health Hazard Communication Program (This information is covered in course HS0001.);
- any operation in the work area where hazardous chemicals are present;
- location and availability of this supplement;
- hazards list;
- MSDSs for the area.

Most of this information is available on the Hazard Notice Door Sign (see Appendix C) at the room's entrance.

Training. Training for new responsibilities shall be provided at the time of initial assignment and whenever a new hazard is introduced. As a minimum, training should cover the following:

- Methods and observations (e.g., sight, smell, color change, monitors, alarms) that may be used to detect the presence or release of a hazardous chemical in the work area.
- Physical and health hazards of the chemicals in the work area.

- Measures employees can take to protect themselves from hazards. These include following safety procedures and using protective equipment.
- Procedures for reading, interpreting, and preparing container labels; reading and interpreting MSDSs; and for reporting a work-related illness or injury to the Health Services Department.
- The actions necessary in the event of spills or emergencies. (This information is often contained in the OSP or FSP.)

The potential hazards of non-routine tasks (e.g., cleaning tanks or working on unlabeled pipes) shall be discussed immediately before each job.

Hazard training should be kept current with an ongoing program of safety meetings; environmental, safety, and health courses; and discussions between workers and supervisors. Training by categories of materials is acceptable, provided that the hazards of groups of materials are similar. For example, no new training is required for a new solvent with similar hazards to an existing chemical for which training has been completed.

The Hazards Control Department offers basic chemical safety courses (HS4240 and HS4246) that cover many of the required general topics (e.g., labeling and safe practices), including customized courses for specific operations or work areas.

Hazardous waste generators or individuals who are required to clean up chemical spills must take additional training (e.g., EP0006 and EP0039). See the *LLNL Course Catalog* for complete course descriptions.

All training shall be documented in accordance with the *LLNL Training Program Manual* and any applicable department or facility procedures.

2.2 Biological Hazards

Code of Federal Regulation, Title 29, Part 1910.1030, covers the control measures and training requirements necessary to prevent exposure to bloodborne pathogens. The scope of DOE Order 5480.10 broadly includes training requirements for all biological hazards. This section combines OSHA and DOE specifications. It also lists situations where biohazards may be present, describes labeling and posting requirements, and specifies the training program necessary for employees with potential exposures. For further details about exposure, work practices, and waste controls, see Chapter 30 of the *Health & Safety Manual*.

2.2.1 Hazard Identification

The following list identifies the major sources, operations, and classes of organisms with the potential for occupationally related exposure. Hazards may be presented by other

types of procedures and carriers than those listed below. Contact your area ES&H team for assistance in determining when biological hazards may be present.

- Human fluids, secretions, or feces
- Class II, III, and IV etiologic agents
- Biological toxins
- Cell and tissue culture systems
- Research involving laboratory animals
- Research involving allergens of biological origin (e.g., certain plant and animal products, danders, urine, some enzymes)
- Contaminated laundry soiled with blood or other potentially infectious materials
- Contaminated sharps
- Unfixed human tissue or organs

Use the ES&H Hazard Notice Door Sign to indicate if any of the above hazard sources is present in a work area.

2.2.2 Labels and Signs

The Hazard Notice Door Sign shall be used to indicate the presence of biological hazards in a work area. In addition, readily observable warning labels shall be affixed to

- containers used to store, transport, or ship specimens;
- containers of regulated waste (decontaminated waste need not be labeled or color coded);
- refrigerators and freezers containing blood or other potentially infectious material;
- contaminated laundry, equipment, or sharp containers.

In some cases, red bags or containers may be substituted for labels. Exemptions to these labeling requirements are possible for items remaining within a facility that uses universal precautions. Contact your area ES&H team for variations permitted by 29 CFR 1910.1030.

Hazard warning signs shall be posted outside areas where work involving human immunodeficiency virus (HIV) or hepatitis B virus (HBV) is performed. Other labels and signs shall incorporate the universal biohazard warning and be fluorescent orange or orange-red with lettering and symbols in a contrasting color.

2.2.3 Information and Training

Employees who may be potentially exposed to bloodborne pathogens at work must receive training at the initial time of assignment and at least annually thereafter. Additional training shall be provided when changes in tasks or procedures affect exposure potential. As a minimum, training shall contain the following elements:

- Access to a copy and an explanation of the content of 29 CFR 1910.1030.
- A general explanation of the epidemiology and symptoms of bloodborne disease.
- An explanation of the modes of transmission of bloodborne pathogens.
- An explanation of the LLNL Exposure Control Plan and access to a copy.
- An explanation of the appropriate methods for recognizing tasks and other activities that may involve exposure to blood and other potentially infectious materials.
- An explanation of the use and limitations of methods that will prevent or reduce exposure including appropriate engineering controls, work practices, and personal protective equipment.
- Information on the types, proper use, location, removal, handling, decontamination, and disposal of personal protective equipment.
- An explanation of the basis for selecting personal protective equipment.
- Information on the hepatitis B vaccine including information on its efficacy, safety, method of administration, the benefits of being vaccinated, and that the vaccine and vaccination will be offered free of charge.
- Information on the appropriate actions to take and persons to contact in an emergency involving blood or other potentially infectious materials.
- An explanation of the procedure to follow if an exposure incident occurs, including the method for reporting the incident and the medical follow-up that will be provided.
- An explanation of the signs, labels, and color coding used to communicate the presence of biohazards.
- An opportunity for interactive questions and answers with the person conducting the training.

The person conducting the training shall be knowledgeable of the subject matter covered by these elements as it relates to the particular workplace.

The Hazards Control Department offers course HS4400, “Working Safely with Blood and Blood-Borne Pathogens.” This course is designed for employees who work directly with human blood, tissues, or other body fluids. Employees who work in laboratories that perform HIV or HBV research or in production laboratories must receive additional

training. Consult year area ES&H team and 29 CFR 1910.1030 for details on bloodborne pathogens.

Training records shall include the dates and content (or a summary) of the training sessions, the names and qualifications of the persons conducting the training, and the names and job titles of all persons attending the sessions. These records shall be maintained for three years from the date on which the training occurred. Employees should be provided a copy of their training records upon request.

2.3 Physical Agents

The physical agents specifically addressed in this supplement are noise and nonionizing radiation because they are the most common at LLNL. Other agents that may be encountered include heat and cold, ultrasonic and infrasonic sound, vibration, and pressure extremes. When planning work that involves exposure to these agents, contact your area ES&H team for guidance on the appropriate training and hazard communication needs. (In some cases, these new activities may require developing new capabilities to measure exposures and/or new exposure criteria.)

2.3.1 Noise

Hazard Identification. Steady exposure to high noise levels and repeated exposure to loud impact noises can lead to permanent deterioration of the auditory system. An evaluation of noise levels and their duration should be conducted, particularly because potentially hazardous levels are not always apparent. A noise survey is necessary whenever normal conversation is difficult, people complain about noise levels, repeated loud impact noises are produced, or hearing protectors are used. For additional information, see Supplement 10.08 of the *Health & Safety Manual*.

Labels and Signs. Work areas with excessive noise levels shall be posted with warnings about exposure time limits and the need for hearing protectors. The area ES&H team will assist Facility Managers and supervisors with such determinations. The Hazard Notice Door Sign shall be used to inform those entering the facility or area of potential noise exposures. Extremely high noise conditions may require additional posting to assure an adequate level of warning. Noisy equipment shall have warning signs indicating that hearing protection is required during operation.

Information and Training. All workers who are exposed to noise above the permissible limits and/or are enrolled in a hearing conservation program (audiometric testing) shall be in a training program. This training shall be presented at the time of initial assignment to a noisy area, and shall be repeated annually or when work processes or hearing protection equipment change. Course HS4360, "Noise," covers the initial training. Course HS4361, "Noise Refresher Training," covers annual retraining or a challenge quiz may be taken.

Both initial and periodic training shall include the following elements:

- Effects of noise on hearing.
- Purpose of hearing protectors; the advantages, disadvantages, and attenuation of various types; and instructions on the selection, fit, use, and care of these devices.
- Purpose of audiometric testing and an explanation of the test procedure.

Personnel exposed to noise levels above the action limit specified by the Hazards Control Department shall have access to a copy of 29 CFR 1919.95, including any other information pertaining to noise exposure.

2.3.2 Nonionizing Radiation

Hazard Identification. Physical agents covered in this section include electromagnetic fields (static field, intense power line and subradiofrequency fields, radio-frequency fields, and microwave radiation), lasers, and non-laser sources of optical radiation (infrared, visible, and ultraviolet radiation). Each has the potential to cause bodily harm at certain power levels and exposure circumstances. Appendix C provides a non-exhaustive list of some sources that can present significant occupational exposure concerns. Consult your area ES&H team for further guidance on the types of equipment, operating conditions, and power levels that may be hazardous. Controls such as barriers, operational procedures, and interlocks limit the risk of exposure for a given activity and piece of equipment. Additional information on these hazards can be found in Chapters 26 and 28 of the *Health & Safety Manual*.

Labels and Signs. The Hazard Notice Door Sign shall be used to indicate the presence of each type of physical hazard and the necessary precautions for entering the work area. This notice may need to be supplemented by higher level warning or danger signs, as required by the American National Standards Institute code (ANSI Z-136.1–1986) or the Institute of Electrical and Electronic Engineers code (see Section 5.0 for complete reference). Requirements for warning signs and labels for lasers can be found in Chapter 28 of the *Health & Safety Manual*. Warnings for magnetic fields, microwaves, and radio-frequency hazards are covered in Supplement 26.12.

Information and Training. Workers who could be exposed to nonionizing fields or radiation emitted by the sources listed in Section C.2 of Appendix C shall complete an appropriate course in the HS437X series (Nonionizing Radiation). Employees who work with or near exposed Class 3B or 4 laser light, or who service any system containing such light, shall complete course HS5200 (Laser Safety).

2.4 Ergonomics

2.4.1 Hazard Identification

The field of ergonomics, or human factors, covers hazards that are prevalent in every type of workplace. These hazards are usually caused by manual material handling and repetitive use of hand tools, computer workstations, or other human work-environment interfaces. Identification and resolution of the problems associated with human factors

may involve biomechanics, engineering, psychology, and management practices, or a broad view of the ongoing processes, tools and equipment, and personnel associated with an activity. Knowledge of past problems can be useful in recognizing potential new ones.

The goals of an ergonomics program are to improve the efficiency of the workplace to an acceptable level without compromising safety and to prevent illness. To accomplish these goals, the ES&H team safety engineer and the Health Services Department provide information about ergonomic hazards and recommend possible solutions to supervisors and workers. They also conduct workplace evaluations upon request. An evaluation may be needed whenever the following conditions are involved:

- Extensive use of computer workstations.
- Manual material handling.
- Frequent and prolonged use of hand tools.
- Use of standard equipment or a single workplace design by people of varying body sizes
- Heavy physical activities or extended work hours and shift variations.

Supplement 26.07, "Ergonomics," provides more details on these issues.

2.4.2 Labels and Signs

There is no standard that requires specific posting of ergonomic hazards. However, good safety practice includes notifying a potential equipment user of any unusual or special procedures and any hidden hazards.

2.4.3 Information and Training

The Health Services Department and the Hazards Control Department offer standard and specialized courses on human factors. Emphasis in these courses is placed on recognizing and preventing illness and injury. Other recommended courses include the following (see the *LLNL Course Catalog* for full descriptions):

- HS5300, "Back Care Workshop"
- HS5310, "Video Display Terminal Ergonomics"
- HS5311, "Ergonomics—The Selection and Use of Hand Tools"
- HS5312, "Video Display Terminal Ergonomics for the Supervisor"

Printed informational materials, including one-on-one training for rehabilitation and workstation evaluations, are also available upon request from either organization.

2.5 Hazard Lists

OSHA stipulates that hazardous chemicals in the workplace must be listed to ensure that those materials requiring an MSDS are identified. DOE also requires listing biological and physical hazards. Other regulatory agencies have similar rules. The master chemical inventory program (ChemTrack) has been implemented and may be

used to notify employees of chemical hazards. Similarly, the Hazards Notice Door Sign may be used to notify employees of the presence of other types of hazards. Hazards information must be provided to all employees, contractors, and others who have a "right to know" where and when hazardous agents may be present.

2.6 Trade Secrets and Classified Materials

It is not permissible to withhold information at the risk of causing harm to employees. During emergencies (e.g., fires, spills, or worker exposures), knowing the exact composition of a material may not be as important as knowing the proper procedures to follow to control the situation. Thus, careful consideration shall be given to the possible adverse effects of materials and plans shall be made accordingly. (This precaution can decrease response time because the necessary information will be ready.) In addition, emergency procedures or medical treatments should be prepared in anticipation of future needs. These measures can be instituted without compromising safety or security. For chemical hazards, the MSDS provides basic first aid and emergency medical guidance. Under normal circumstances, the exact identity of proprietary or classified agents may be protected using trade names or codes. However, the underlying health and safety hazards must be made clear so that precautionary measures and employee training can be implemented.

2.6.1 Trade Secrets

Some manufacturers have *bona fide* secret formulas for their products. In a medical emergency or for first-aid treatment, however, these manufacturers must immediately disclose the identity for their products to the physician or nurse administering care. (Manufacturers may require a written statement of need and confidentiality after the emergency.) In non-emergencies, employees may request such information in writing, giving sufficient occupational health reason(s) why the information is needed (e.g., exposure assessment, medical surveillance or treatment, assessment or selection of engineering controls, or personal protective equipment). Even then, the manufacturer (supplier) may choose to release the information only upon request from industrial hygienists or health care providers.

Further disclosure of a trade secret within LLNL will be controlled because manufacturers have a right to demand a written agreement that the information provided will not be used for any other purpose. Any such agreement between LLNL and an outside vendor shall be handled by the legal office. (Experience has shown that there are very few problems in this area.)

2.6.2 Classified Materials

Unclassified emergency response plans (medical and fire) can be prepared in advance with no loss of effectiveness. These plans shall be reviewed by the program, Classification Office, and ES&H staff to ensure that all factors are properly addressed without revealing protected information. Select ES&H individuals are granted a need-to-know status in some instances. The purpose of pre-planning is to eliminate the delay in treatment or response while the issue of classification is being resolved.

2.7 Outside Contractors

LLNL area supervisors will provide outside contractors with hazard information relevant to their work area. They shall also keep the ES&H team and contractors updated if substantial changes occur while these contractors are working onsite. Likewise, contractors shall provide the contracting officer a chemical hazard list and the MSDSs for materials brought onsite and refer all problems to the contract administrator, construction supervisor from Plant Engineering, or the ES&H Team 4 Construction Safety Engineer.

2.8 Exposure Monitoring

The Hazards Control Department monitors air and surface contaminants to determine if exposures are less than occupational exposure limits and if engineering controls are performing as intended. Often, such monitoring is initiated based on professional judgment of the likelihood of excessive concentrations. OSHA requires an exposure evaluation for the regulated hazardous substances in Table 1. Before using any of the chemicals in this table, contact your area ES&H team to make monitoring arrangements. Other materials are monitored on a case-by-case basis. Written notification is given to an employee if environmental monitoring results indicate that the employee is exposed above permissible limits.

2.9 Medical Records

Employees have a right to know the results of any medical examinations completed or ordered by the Health Services Department. These results are reported to employees by the clinician reviewing the findings.

The Health Services Department maintains complete medical records for each employee. These confidential records are handled as medically privileged information and are only released upon receipt of a signed request from the employee (or his/her designee). Copies of medical records requested are made available within 15 working days of receipt of a written request.

3.0 Responsibilities

The responsibilities described in this section apply to implementation of the LLNL Health Hazard Communication Program. Overall health and safety responsibilities are covered in Chapter 1 of the *Health & Safety Manual.*

3.1 Managers

LLNL policy and DOE orders expect that managers will be responsible for implementing many of the ES&H program requirements. Chapter 1, Section 1.02, of this Manual specifies that managers shall inform employees of workplace health hazards and provide training on safe work practices.

Table 1. Substances with OSHA monitoring requirements.[a]

Chemical substance[b]
2-Acetylaminofluorene
Acrylonitrile
4-Aminodiphenyl
Arsenic, inorganic
Asbestos
Benzene
Benzidine
Bis(choromethyl) ether
Cadmium
Coal tar pitch volatiles
1,2-Dibromo-3-chloropropane
3,3´-Dichlorobenzidine (and its salts)
4-Dimethylaminoazobenzene
Ethyleneimine
Ethylene oxide
Formaldehyde
Lead
Methyl chloromethyl ether
4,4´-Methylene dianiline
1-Naphthylamine
2-Naphthylamine
4-Nitrobiphenyl
N-nitrosodimethylamine
2-Propiolactone
Vinyl chloride

[a] Contact the ES&H team for assistance.

[b] Refer to 29 CFR 1910.1001 through 1910.1048.

In the LLNL matrix system a manager may have program, facility, and/or payroll responsibilities for a worker. To clearly specify how the LLNL Health Hazard Communication Program will be implemented in this situation, the following definitions are used for the purposes of this supplement:

- **Employee supervisor**—A payroll supervisor or project leader responsible for directing the actions of employees who handle, use, store, or may be potentially exposed to occupational health hazards.

- **Area supervisor**—The person responsible for the physical space, equipment, storage area, structure, and room where health hazards are located, used, or produced. (The "room responsible person" is another term used for the area supervisor.) One person may fill the roles of both the employee and area supervisor in many situations. But it is mandatory that departments or divisions designate an area supervisor for each room and for any other location where health hazards exist.

All managers supervising workers who may be potentially exposed to workplace health hazards are required to take course HS4050, "Health Hazard Communication for Supervisors," or course HS4052, "Health Hazards Communication for Supervisors of Chemical Labs." Non-supervisors should take these courses if assigned safety-related tasks. These courses cover specific responsibilities for supervisors, the LLNL Health Hazard Communication Program, and an overview of this supplement.

3.1.1 Employee Supervisor

The employee supervisor shall do the following:

- Inform employees and unescorted visitors about LLNL's policies and procedures for health and safety.
- Identify the hazards present in the work area.
- Provide specific training on hazards that may be encountered on the job. (Area supervisors may assist in matters that pertain to the workplace or facility in which they occur.)
- Provide the information described in Section 2.2.3.
- Ensure that employees
  - — follow established safety procedures;
  - — know and understand how to request monitoring information about exposures;
  - — report any work-related illness or injury to the Health Services Department.
- shut down unsafe operations.

3.1.2 Area Supervisor

The area supervisor is responsible for health and safety matters related to the physical work area. Because one work area may contain the activities of multiple projects, employees, and supervisors, the area supervisor shall ensure that the safety policy is consistently enforced. In support of the LLNL Health Hazard Communication Program, the area supervisor shall

- prepare and update annually the Hazard Notice Door Sign (see Appendix C), and place this sign outside each area where hazards exist;
- when necessary, obtain the MSDSs for workers in the area (see Section 2.1.2);

- ensure that the controls required by safety procedures (FSPs and OSPs) have been provided;
- train workers on the use of facility-specific alarm systems and emergency procedures, including the precautionary measures required for hazardous conditions;
- inform employees and outside contractors about the presence of any hazardous condition they may be exposed to, including the precautionary measures;
- report the unsafe activities of workers to the responsible supervisor;
- make available to contractors the chemical hazard list and other relevant precautionary information (e.g. alarms, unlabled pipes, and the hazardous agents to avoid);
- shut down unsafe operations.

3.2 Employees

Employees shall

- plan and conduct operations in accordance with established procedures and good safety practices;
- comply with established policies and procedures;
- use prescribed protective equipment and clothing;
- know where and how to obtain information on hazardous materials;
- know the toxicity, hazards, and precautionary procedures for the chemicals used in their work areas;
- report questionable activities involving hazardous agents or conditions to their line or area supervisor;
- shut down unsafe operations.

3.3 Hazards Control Department

In support of the LLNL Health Hazard Communication Program, the ES&H team shall provide guidance on the safe use of hazardous agents. This guidance includes

- assisting supervisors in identifying the hazards present in the work area;
- evaluating the potential hazards of operations;
- monitoring the workplace to determine employee exposure levels, as required by 29 CFR 1910.1001–1910.1048;

- selecting or recommending appropriate personal protective equipment and engineering controls;
- providing health hazard communication training to supervisors;
- assisting supervisors with employee training;
- maintaining an employee-exposure database.

4.0 LLNL Contacts

Contact the following for further information on the specific areas below.

- Hazard identification and area specific training—area ES&H team
- General training, course scheduling, and information—Hazards Control Safety Analysis and Training Division, ext. 2-5158
- Issues associated with the Health Hazard Communication Program—Hazards Control Industrial Hygiene Group, ext. 2-1214
- Medical records—Health Services Department, ext. 2-7459.
- ChemTrack Hotline, ext. 4-4404
- MSDS Hotline, ext. 3-2122

5.0 Supporting References and Standards

American National Standards Institute, *Safe Use of Lasers*, ANSI Z-136.1-1986, American National Standards Institute, New York. 1986.

Code of Federal Regulations, Title 29, Part 1910.1200, *Hazard Communication*, Occupational Safety and Health Administration, U.S. Government Printing Office, Washington DC.

Code of Federal Regulations, Title 29, Part 1910.1450, *Occupational Exposure to Hazardous Chemicals in Laboratories*, Occupational Safety and Health Administration, U.S. Government Printing Office, Washington DC.

Code of Federal Regulations, Title 29, Part 1910.20, *Access to Employee Exposure and Medical Records*, Occupational Safety and Health Administration, U.S. Government Printing Office, Washington DC.

Code of Federal Regulations, Title 29, Part 1910.1030, *Bloodborne Pathogens*, Occupational Safety and Health Administration, U.S. Government Printing Office, Washington, DC.

Code of Federal Regulations, Title 29, Part 1910.95, *Occupational Noise Exposure*, Occupational Safety and Health Administration, U.S. Government Printing Office, Washington, DC.

DOE Order 5480.10, "Contractor Industrial Hygiene Program," June 26, 1985.

Institute of Electrical and Electronic Engineers. *American National Standard Safety Levels with Respect to Human Exposure to Radio Frequency Electromagnetic Fields, 3 kHz to 300 GHz*. IEEE, New York. 1990.

Appendix A

Terms and Definitions

Below are terms and definitions used in this supplement. These terms are frequently used in health hazard communication and are taken from 29 CFR 1910.1200.

article	A manufactured item that (1) is formed to a specific shape or design during manufacture; (2) has end-use function(s) dependent in whole or in part on its shape or design during end use; and (3) does not release or otherwise result in exposure to a hazardous chemical under normal-use conditions.
container	Any bag, barrel, bottle, box, can, cylinder, drum, reaction vessel, or storage tank that contains a hazardous chemical. For the purposes of this supplement, pipes or piping systems, engines, fuel tanks, or other operating systems in a vehicle are not considered to be containers.
employee	A worker who may be exposed to hazardous chemicals under normal operating conditions or in foreseeable emergencies. Workers (e.g., office workers) who encounter hazardous chemicals only in non-routine, isolated instances are not covered by the requirements of 29 CFR 1910.1200.
exposure or exposed	When an employee is subjected to a hazardous chemical during employment through any route of entry (e.g., inhalation, ingestion, skin contact, or absorption), including potential exposure (e.g., accidental or possible).
foreseeable emergency	Any potential occurrence such as, but not limited to, equipment failure, rupture of containers, or failure of control equipment that can result in an uncontrolled release of a hazardous chemical into the workplace.
hazardous chemical	Any chemical that presents a physical or health hazard.
hazard warning	Any word, picture, or symbol (or a combination thereof) appearing on a label or other appropriate form of warning that conveys the hazard(s) of the chemical(s) in the container(s).
health hazard	A chemical for which there is statistically significant evidence, based on at least one study conducted in accordance with established scientific principles, that acute or chronic health effects may occur in exposed employees.

	The term “health hazard” includes chemicals that are carcinogens; toxic or highly toxic agents; reproductive toxins; irritants; corrosives; sensitizers; hepatotoxins; nephrotoxins; neurotoxins; agents that act on the hematopoietic system; and agents that damage the lungs, skin, eyes, or mucous membranes.
immediate use	When a hazardous chemical is controlled and used by the person who transfers it from a labeled container, and used only within the work shift during which it is transferred.
physical hazard	1. A chemical for which there is scientifically valid evidence that it is a combustible liquid, compressed gas, explosive flammable, organic peroxide, oxidizer, pyrophoric, unstable (reactive) or water-reactive. 2. Nonionizing fields and radiations (e.g. microwaves, magnetic fields), lasers, and noise.
produce	To manufacture, process, formulate, or repackage.
responsible party	Someone who can provide additional information on the hazardous chemical and appropriate emergency procedures, if necessary.
trade secret	Any confidential formula, pattern, process, device, information, or compilation of information used in an employer’s business that gives the employer an advantage over competitors who do not know or use such information.
work area	A room or defined space in a workplace where hazardous chemicals are produced or used, and where employees are present.
workplace	An establishment, job site, or project at one geographical location containing one or more work areas.

Appendix B

Requesting and Preparing Material Safety Data Sheets

B.1 Requesting MSDSs

Use the request form at the end of this appendix to obtain MSDSs. To discuss any problems or special needs, call the MSDS Hotline (ext. 3-2122) or QuickMail the MSDS coordinator.

B.2 Requirement for Preparation

Whenever a new hazardous material is synthesized or formulated, the producer is required to prepare an MSDS before the material can be sent to another workplace. For example, if another organization will use a new compound developed at the Laboratory, LLNL must develop the MSDS to accompany the material. This appendix describes the general approach for writing and distributing LLNL-prepared MSDSs. Requirements mandated by OSHA can be found in 29 CFR 1910.1200, paragraph (g), and Appendices A and B.

B.3 MSDS Content

At minimum, each MSDS shall contain the following:

- Identity of the material, including hazardous ingredients comprising 1% or more of mixtures or 0.1% or more of carcinogens.
- Physical and chemical characteristics.
- Physical hazards, including the potential for fire, explosion, and reactivity.
- Health hazards, including signs and symptoms of exposure, and any medical conditions generally recognized as being aggravated by exposure to the chemical.
- Primary routes of entry.
- OSHA's permissible exposure limit, the American Conference of Governmental Industrial Hygienists (ACGIH) threshold limit value, and any other exposure limit that has been recommended and adopted for use at LLNL.
- Whether the hazardous chemical is listed as a carcinogen.
- Any generally applicable precautions for safe handling.

- Any generally applicable control measures such as engineering controls, work practices, or personal protective equipment.
- Emergency and first-aid procedures.
- Date the MSDS was prepared or last changed.
- Name, address, and telephone number of the responsible party who prepared and distributed the MSDS and can provide additional information on the hazards and appropriate emergency procedures.

B.4 MSDS Preparation

B.4.1 Technical Input

Thorough completion of the MSDS requires successful interaction among the following:

- Chemical producer
- Health Services Department
- Hazards Control Department
- Environmental Protection Department

In addition, technical experts from other LLNL organizations may be consulted for their particular expertise and to review assembled material.

B.4.2 Data Sources

LLNL is not required to conduct new or additional health and safety testing of a product if the test results from scientific literature are accepted. Besides this literature, contacts and reports available through the DOE complex should be identified and considered for inclusion. If no relevant information is found for a given category, the MSDS shall be marked to indicate that finding.

B.4.3 Updates

The MSDS shall be updated to reflect any findings within three months of becoming aware of significant information regarding the hazards of a chemical or ways to protect against hazards.

B.4.4 Preparation Coordination

The Industrial Hygiene Program will coordinate the preparation and updates of MSDSs and serve as the contact point for external organizations.

MSDS Request Form

Requester's Name: _____

Phone#: _____ Fax#: _____ L-Code: _____

Date Requested: _____ Date Needed: _____

Company Name	Product Name
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

*Both the **Company's Name** & the **Product Name** should be completed whenever possible.*

Send or Fax completed requests to:
MSDS Coordinator, L-384
MSDS Fax#: 422-5270

MSDS Hotline#: 423-2122

Date Complete: _____

Appendix C

Hazard Notice Door Sign

The Department of Energy and OSHA require the hazards for each area to be listed. The LLNL ChemTrack Project collects only part of the necessary information to be given to employees. Additional hazards, such as those indicated below, shall be identified on the Hazard Notice Door Sign (Fig. C-1). For more information on completing this sign, refer to Chapter 11 of the *Health & Safety Manual.*

C.1 Chemical Hazards

List the following generic groups if present:

- Combustibles or flammables
- Corrosives
- Oxidizers
- Explosives, pyrophorics, or reactives
- Compressed gasses
- Systemic toxins

List any of the following if present:

- OSHA "select carcinogens" or reproductive hazards
- Beryllium
- Large amounts of a single hazardous substance (e.g., >5 gal. nitric acid)

C.2 Physical Hazards

List the following when there is a potential for occupationally related exposure:

- Steady magnets >0.5 mT (5G)
- 60-Hz electric fields >2.5 kV / m
- 60-Hz magnetic fields >0.1 mT (1G)
- Rf equipment between 3 kHz and 300 GHz radiating >10mW
- Permanent communication transmitters
- Portable communications sets radiating 7W at frequencies between 100 kHz and 450 MHz, or >7 (450 / f) W at frequencies between 450 Hz and 1.5 GHz (f = frequency in MHz)
- Induction heaters
- Class II, IIIa and b, and IV lasers

NOTICE

THE FOLLOWING HAZARDS ARE PRESENT IN THIS AREA

Building: Room:

☐ Ionizing Radiation	☐ Carcinogens, Acutely Toxic, or Reproductive Hazards	☐ Moving Machinery
☐ Radioactive Materials Management Area	☐ Explosives	☐ Electrical Sources
☐ Flammables	☐ Biohazards	☐ High Pressure
☐ Reactive Chemicals	☐ Other: List _____ _____ _____	☐ High Noise

- Special Hazards and Precautions:

☐ Eye Protection Required	☐ No Eating, Drinking, or Smoking	☐ Other Precautions: _____ _____ _____

- Additional guidance for hazardous operations in this area is in the following safety procedures:

- Applicable OSHA Standard: ☐ Chemical Hygiene Plan ☐ Hazard Communication Program
- Material Safety Data Sheets (MSDS) for hazardous operations in this area are available in Building _____ Room _____ and through the MSDS Hotline at ext. 3-2122.

Additional information may be obtained from:

Responsible Individual: _____ Page: ____ Ext.: ____ Home Phone: _____

Alternate Facility Contact: _____ Page: ____ Ext.: ____ Home Phone: _____

ES&H Team Rep: _____ Page: ____ Ext.: ____

HWM Technician: _____ Page: ____ Ext.: ____ Date Prepared: _____

For off-shift support contact ext. 2-7595 LL 6369 (9/94) 7600-72713

Figure C-1. Hazard Notice Door Sign.

- Infrared sources >10W
- Arc lamps
- Ultraviolet sources >1W
- Noise sources >85 dBA

C.3 Biological Hazards

List the following when there is a potential for occupationally related exposure:

- Human fluids, secretions, or feces
- Class II and III etiologic agents
- Biological toxins
- Recombinant DNA work
- Cell and tissue culture systems
- Research involving laboratory animals
- Research involving allergens of biological origin (e.g., plant and animal products, dander, urine, some enzymes)
- Contaminated laundry soiled with blood or other potentially infectious materials
- Contaminated sharps
- Unfixed human tissue or organs